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CASE STUDY

**JOHNSON & JOHNSON: BUILDING
AN INFRASTRUCTURE TO SUPPORT
GLOBAL OPERATIONS**

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Johnson & Johnson: Building an Infrastructure to Support Global Operations

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ABSTRACT

Johnson & Johnson, Inc. has over 100 years' experience operating in decentralized management practices, but its customers are increasingly demanding that J&J present "a single face." This means that J&J must coordinate sales, distribution, financial, and marketing information across its 160 operating companies. This case reviews possible strategies for developing an information technology infrastructure that would enable J&J to be more responsive to its customers' demands. The case cites both technical and organizational challenges inherent in implementing a more centralized infrastructure.

This is one in a series of case studies developed for MIT's executive education course on "Managing the IT Network for Global Competitiveness." The case study and accompanying teaching note are intended to describe and analyze one company's experiences in building and managing its IT infrastructure.



Johnson & Johnson: Building an Infrastructure to Support Global Operations

Introduction

On January 1, 1995, Johnson and Johnson (J&J) established J&J Health Care Systems (HCS) whose mission was to provide J&J products to large managed care and provider organizations. HCS was a 1,200 person company representing the J&J U.S. pharmaceutical, diagnostic, medical/surgical and consumer companies to customers like HMOs, integrated delivery systems and hospital organizations. At the same time, it was a center of excellence defining the needs of this new breed of customer to the J&J operating companies. HCS was a response to the changing health care industry. Dennis Longstreet, Chairman of J&J HCS, explained:

The industry itself is reshaping and it's brought on by the desire for the payor to focus on the economics of health care. What's happened is that stand-alone hospitals and physicians, who had been our primary customers for health care products, are no longer the sole decision-makers. It's become an integrated delivery system, where the doctor and the hospital and the payor and insurance company are all becoming more connected to focus on delivering cost-effective quality health care.

J&J HCS was the second company that Johnson & Johnson had created to market products of existing companies to large customers. Johnson & Johnson's Customer Support Center was created in 1992 to sell J&J consumer products to large U.S. retailers like Wal-Mart and KMart. Jim Litts, President of the Customer Support Center, noted that his efforts to work closely with six different operating companies represented a counter-cultural approach to work at J&J:

J&J has over 100 years of history authorizing operating companies to manage all business facets to maximize their brands' P&Ls. Today, we are learning how difficult it is to break those paradigms and work together to leverage the strength of Johnson & Johnson with larger retail customers.

While HCS and the Customer Support Center were different from J&J's usual independent operating company model, Longstreet and Litts felt they were representative of how J&J would operate in the future. The two executives noted that the inter-company cooperation and coordination demanded by this organizational model had significant implications for J&J's culture and for the amounts and kinds of information that would be communicated and shared across J&J operating companies.

This case was prepared by Jeanne Ross at the MIT Center for Information Systems Research. It may be freely distributed to students in not-for-profit educational institutions. The author would like to thank Mike Vitale, Jack Rockart and Debra Hofman for their helpful comments and the many Johnson & Johnson employees who contributed insights, cooperation and support.

Background

Johnson & Johnson, with 1994 sales of over \$15 billion, was the world's largest manufacturer of health care products. Founded in 1886 as the first manufacturer of sterile dressings, the company had nearly doubled in size since 1987 and typically depended for one-third of its revenues on products that had been introduced within the prior five years. J&J sold products ranging from baby shampoo to treatments for leukemia and from disposable contact lenses to stents that could be inserted in arteries to improve the results of balloon angioplasty. In 1995, J&J had approximately 80,000 employees in about 160 operating companies, with markets in over 150 countries world-wide. (See Appendix A for a representative list of companies.)

Johnson & Johnson had a long history of managing its operating companies as independent businesses. Corporate executives, dating back to Robert Wood Johnson in the 1930s, embraced operating company autonomy as a path to increased flexibility, accountability and creativity. Independent analysts also credited the decentralized J&J management approach as largely responsible for the corporation's consistently strong financial performance¹. The independence of the individual units, however, meant that J&J employees tended to view themselves as employees of a particular J&J operating company rather than of the corporation. There was rarely any movement of employees between operating companies, and operating company executives were compensated based on the performance of their company, not the corporation as a whole. Consequently, J&J companies often regarded one another more as competitors than as members of the same team.

By the early 1990s, top executives noted that J&J's autonomous operating companies were not well-positioned to service customers who were trying to limit the number of their vendor interactions. Each operating company had its own marketing and sales arm that worked directly with its customers. Matthew Martin, Vice President of Information Services for HCS, explained one consequence of this arrangement:

Prior to the formation of Health Care Systems, each of the operating companies had a national accounts representative. Johnson & Johnson did not focus as a single corporation on its top customers. We could have up to 18 representatives from different J&J Companies calling on a customer. Eventually, we listened when the customer said, "Time out! Why can't Johnson & Johnson send me one person to deal with to negotiate a contract. It's more efficient for me and it must be for you too!"

Over time, corporate management introduced a variety of structures to mitigate the limitations of the decentralized management approach and increase inter-company cooperation. For example, the operating companies were organized into three groups: Consumer, Pharmaceutical, and Professional, and the chairman of each group was given responsibility for identifying opportunities for leveraging services and expertise across companies in each of these markets. Franchise managers were assigned responsibility for coordinating cross-company sales of a family of products, such as the baby care products of operating companies like Johnson & Johnson Consumer in the U.S., Johnson & Johnson France, and Johnson & Johnson Pacific Pty. Ltd. in Australia. Finally, the introduction of HCS and the Customer Support Center

¹See Tanouye, Elyse, "Johnson & Johnson Stays Fit by Shuffling Its Mix of Businesses," *Wall Street Journal*, December 22, 1992, p. A1, and Weber, Joseph, "A Big Company That Works," *Business Week*, May 4, 1992, pp. 124-132.

represented radically new ways to organize work at J&J. These companies focused on working across U.S. companies to address the needs of U.S. customers, but they could eventually be expanded or similar organizations could be introduced in other countries.

When the operating companies had been completely autonomous, they had little need to share data. Most information flowed between a company and its customers, while financial data flowed from the company to corporate headquarters. Consequently, information systems, computing platforms, and data definitions grew up in J&J around individual company needs. As headquarters attempted to work across companies, management found that existing information systems and information system structures did little to facilitate those efforts. IS and business executives felt a need to build an information infrastructure that would respond to J&J's changing customer demands.

J&J's Information Technology Infrastructure

Consistent with J&J's decentralized approach to management, most information technology management responsibility was distributed to the operating companies. Each company typically had an independent information system unit responsible for systems planning, development, operations and maintenance. Operating company IT units also hired all their own IT staffs and were responsible for their compensation and professional development. While historically there had been little cross-company coordination among IT professionals, Group IT Vice Presidents were appointed in 1993 and IT directors from the operating companies had dotted line reporting responsibility to them. (See the organization chart for the Corporate Office of Information Technology in Appendix B.)

While most infrastructure support, such as LAN management, help desk, desktop support, and local computer and telecommunications operations was provided by operating company IS departments, a small centralized IT function was based in the corporate data center in New Jersey. Called Networking and Computing Services (NCS), this centralized unit was responsible for the data center, but its primary responsibility was for managing J&J's global network and providing mainframe computing services for all J&J businesses in the U.S.

J&J's global network was a traditional multiplexed T1 network providing telephone and dial-up data links between J&J headquarters, operating companies, and related facilities throughout the world. The fifty persons in the Corporate Network Services unit of NCS were responsible for contract negotiation and administration of telecommunications contracts, data network engineering and design, remote PBX and voicemail management, videoconferencing, and limited Internet support. NCS had not historically provided systems management or support for end-users and applications programmers, in part because the network environment was not conducive to centralized support. The operating companies had built a maze of subnetworks on a wide variety of computing platforms and Network Services did not have the network management tools, the breadth of expertise, or the charter to manage those subnetworks.

While most of J&J's operating companies received network support directly from Corporate Network Services in New Jersey, European companies (Western and Eastern Europe, Middle East, and Africa) received support from a regional center in Belgium. The European regional center managed a router-based, single transport, primarily TCP/IP network from one central location. This network was a subset of J&J's global network and supported 100 European J&J locations with a backbone of over one hundred routers. More than a thousand servers were connected to the network and European Network Services staff managed the routers for all the local LANs to ensure that no one at a company site could configure a LAN in a manner that would jeopardize someone else. The tightly controlled nature of the network

enabled a team of eleven J&J employees and six contractors to offer centralized support to European companies.

This team not only managed the physical part of the network (telecom lines, routers, voice multiplexers) but had increasingly emphasized deploying enterprise network applications like e-mail, groupware, executive support systems, affiliate communication, and set-up. Jos DeSmedt, Director of European Network Services, noted some implications of centralized network management:

The design and management [of the European Network] facilitates very tight LAN and WAN integration. Since there are no subnetworks for individual companies or franchises anymore, the Network management becomes much more critical. On the other hand, we can automate the management more uniformly over the region from this central location.

The European Network Services unit had evolved from the Janssen Pharmaceutical IT unit, which serviced the largest operating company in Europe. Because many European operating companies were small, there were sometimes just a couple IT people addressing the needs of entire countries. Over time, they had purchased services from Janssen, which had resulted in many operating companies adopting Janssen standards for hardware and software. Thus, when European Network Services was formally established in July 1994, much of the service it provided had already been centralized.

Although U.S. companies were typically larger and more self-sufficient with regard to their IT needs, Bob Chaput, Vice President of Networking and Computing Services, considered the European network a model for J&J. He anticipated developing additional regional network service centers in Asia and Latin America. More immediately, he intended to upgrade the services available from the corporate facility. He created a team in his unit to evaluate and support infrastructure applications as well as a team to develop new network services. (See the Network and Computing Services organization chart in Appendix C.) He noted, however, that for these teams to fully realize their potential, the Networking and Computing Services organization would have to take a more proactive role in defining networks within the operating companies:

We know that [centralized network support] will work because we've been successful in Europe. The difference is the companies in the U.S. are bigger and stronger. They have more people and they fight harder and longer to retain control and independence. But the businesses' applications people generally are happy to have some stability in infrastructure applications like e-mail and Notes to have something they know works and something they know is supported 24x7.

In early 1995 IT management identified four limitations with J&J's current infrastructure to help the company adapt to changing business conditions, particularly initiatives like HCS and the Customer Support Center. First, the amount of IS attention allocated to infrastructure management across the company was diluting the attention that could be focused on more strategic IT applications. Second, the lack of technology standards was inhibiting connectivity, aggravating attempts to service business needs, and costing too much to support. Third, the funding process for infrastructure projects was retarding efforts to build an enterprise-wide infrastructure. Finally, lack of data standards was impeding the meaningful exchange of data across companies.

Allocation of IS human resources

Bob Chaput estimated that 550 of J&J's approximately 1,500 IS professionals were engaged in supporting infrastructure technologies in the U.S. alone. He felt that centralizing functions such as telecommunications support, help desk, desktop and local area network management, and computer operations could cut that number in half, even if most of the staff remained physically located in operating companies. His goal was to free up IT resources to work on higher business value projects through increased centralization of infrastructure responsibilities in order to gain economies of scale and eliminate redundant work.

As a start, five major Professional Group companies in the U.S. had agreed to turn over responsibility for voice communications to Chaput's organization. In addition to its usual responsibility for working with vendors to design and install connections, Networking and Computing Services would have continuing management responsibility for telecommunications tasks such as voice mail and PBX moves, adds, and changes for the Professional Group companies. Warren Koster, Vice President of Information Technology for the Professional Group, noted that the companies expected centralized services to yield significant savings as well as some less tangible benefits:

What we are driving to is leveraging the components of the infrastructure in Professional Group companies and driving costs out. At the same time, it's not just to drive out costs. It's to get people working on other projects that are more competitive and higher on the value chain and not worrying about the infrastructure parts.

Koster acknowledged that, despite the apparent efficiencies, there would be hesitancy to move towards shared services like this, because of concerns about potential personnel shifts and decreases in service levels. The Professional Group companies were preparing to centralize their distributed systems management, and some operating company IT directors expressed concern that this responsibility should remain local because it demanded more personalized service than telecommunications, which was viewed as a commodity service. But while some IT managers were anxious about increased centralization of infrastructure responsibilities, others were enthusiastic supporters. Carolyn McQuade, Vice President of Information Technology for the Consumer Group, wanted to leverage expertise:

We need to extend centralized management control of the infrastructure down to the desktop level. The amount of time that we all spend debugging software like WordPerfect 6.0 is just ridiculous. We all load the same software, discover the same bugs and go through the same experiences as many times as there are companies. It's a shameful waste. Some organizations have more talented people in that area than others. We really could do a much better job of leveraging what we know.

Establishing Information Technology Standards

Not surprisingly, the autonomy of the IT units at the operating companies had led to great variety in the technologies they employed. On the hardware side, there was variation in technologies like routers and bridges and small wars between MacIntosh and Windows computer users. On the software side, J&J had nine different email systems, frequent debates about desktop products, and a variety of network operating systems. Jan Fields, Director of Corporate Network Services, noted that enforcing a limited set of standards was key to enabling centralization of infrastructure services:

You can't possibly build the skills for half a dozen different kinds of routers and bridges, for example. It's foolish to do that. Managing nonstandard equipment when you have a problem, trying to sectionalize and troubleshoot it, and get the correct vendors involved — all of those kinds of things add a tremendous amount of time to solving any kind of problem.

The need to integrate different companies' systems and provide communication links for J&J HCS and the Customer Support Center highlighted the limitations of diversity in technologies. Networking and Computing Services had established standards but operating companies were not always quick to adopt them. Nonetheless, the Customer Support Center's Jim Litts noted that he expected IT to establish standards and affiliated companies to conform to them:

In my mind the IT community ought to come out and talk about the hardware and software to run this stuff. I think we ought to stop giving the operating companies votes. My point is, the software doesn't matter. Everybody will complain about it anyway. So let the IT guys make the economical, efficient choice, understanding, of course, what the user requirements are.

Funding Infrastructure Investments

Infrastructure development efforts by both Corporate and European Network Services were requisitioned by operating company management, who had to pay for whatever services they received. This charging mechanism sometimes acted as a deterrent to infrastructure investments. Bob Chaput provided an example:

We'll have a franchise manager sitting in our Consumer business in New Jersey asking for manufacturing information from our plant in Singapore. Well, guess who's not connected? And so, the franchise manager will say, "Well, just go knock on their door and tell them you're here to install it." So we dutifully go out and knock on the door and say, "We're here to install your network connections at \$1000 a month." And the local management says, "Time out, I don't have a thousand dollars a month."

Jan Fields noted that individual operating companies did not always see the benefit of infrastructure investments. Start-up businesses, in particular, might feel that limited funds were better spent elsewhere:

They can say, "We can dial up for email and if we get it a day later or two days later it doesn't matter." They want to put their money where it is going to impact their customer. They may say to us "For five different countries, I expect to pay a total of no more than \$2000 a month." You can't deliver service for that. But if that's what it is worth to them, then that's what it is worth.

Cross-company organizations like HCS and the Customer Support Center required that operating companies make changes for the good of J&J, even when the cost to the company seemed high. Funding processes that charged individual companies for infrastructure development could negatively impact investment levels. Chaput was trying to move discussions on infrastructure funding to higher organizational levels:

When I go out into an operating company, I do a proposal, you react to it and we go back and forth. When you finally get the money, I get to start the project. We want to get out in advance of that. We want to build the interstate highway system. We want to be judicious about it, but we want to move towards the model of getting a congressional appropriation bill through and starting the project.

Creating Data Standards

The limitations of the existing infrastructure for addressing the changing needs of the business were exposed by the creation of the Customer Support Center and J&J HCS. When the Customer Support Center attempted to sell for national accounts, differing data definitions hindered efforts to understand how much total business any one customer did with J&J and what services J&J could offer. Jim Litts explained:

If you go to a mass merchandiser as Johnson & Johnson, you can walk in there as the number one or number two non-food manufacturer on that account. At the same time you can bring things like pharmaceutical, professional, and pharmacy information and counsel and advice and ideas from our other J&J companies. If you do that together as J&J, you have a tremendous ability to start opening doors that you cannot do if you're one company selling sanitary protection products. You can go in there as J&J and have this story. So the guy says, "Okay, good. Give me some help." You turn around and you say, "Good grief, none of this stuff adds up." You spent an inordinate amount of time just trying to get the information together. Then you take it in there and they ask three questions, and you've got to go back and do it all over again.

Steve Piron, Vice President of Information Architecture, observed that franchise management also demanded cross-company information that was not available from existing systems:

J&J France, for example, defined for itself the information it needed about the French Consumer business. But when we moved to worldwide franchises, like our shampoo business, we were stuck from an information point of view because we had product codes and product costs and definitions around the customer defined on a country level, and not a region [e.g. Europe] or a worldwide level. So we had apples and oranges from an information point of view.

Even where companies used common systems, they had, on occasion, abandoned common data definitions. The Consumer companies, for example, had all adopted the same homegrown order entry system, but as Jim Litts explained, they did not all adopt the data definitions:

Sales reporting for [Consumer] companies all comes out of the Group order entry system and is passed back in a uniform kind of format and information display. Then every company takes that and alters it. So when you try to add it back up again, or if you take the order entry system numbers and then go down and have a conversation with the company, they're different.

Building the IT Unit of the Future

To support J&J's efforts to increase cross-company cooperation and coordination, Ed Parrish, the corporation's chief information officer, identified three initiatives intended to enable easy sharing of information across companies: (1) standardizing data definitions and formats for key data elements on a world-wide basis, (2) defining and establishing the information technology infrastructure needed to share data and information electronically, and (3) developing and applying IT expertise as a corporate rather than a company function. These internal IT efforts were expected to increase the effectiveness of the IS unit and allow more time and attention for strategic applications of information technology.

Steve Piron was heading up efforts to standardize critical data definitions and the methods for communicating them. Along with a team of IT professionals who would recommend data standards to higher level IT and business managers, Piron was working to develop a data warehouse accessible, as needed, by J&J decision makers. Piron's teams would be putting a process in place that defined standard data definitions in critical areas like customer, product, competitor, supplier, and then determine which would be shared on a world-wide basis, which was a regional data item, and which was a country data item. They would also define processes to see that the standards got implemented in transaction processing systems around the world. HCS and the Customer Support Center had already specified some definitions and these would be presented to other companies.

NCS had started to define specific standards for hardware and software such as desktop office suites and LAN operating systems. Matthew Martin of HCS noted that these standards would be HCS standards, and that this expectation had been communicated to all eighteen HCS companies. Executives at each company had been asked to specify needed dollar resources, and time frames in order to "get up to speed." Ed Parrish noted that one company that was part of the HCS initiative had been adamantly opposed to standards, but quickly moved toward implementing them once HCS had made that commitment. Parrish said he would target 80% acceptance of standards, because by that point the other 20% would stand out and senior management would quickly bring them into line, if appropriate.

Parrish planned three efforts to position IT as a corporate function. First, he would initiate training programs in which IT staff throughout the corporation were taught what they needed to know about IT at Johnson & Johnson. Second, he would impact pay and performance by having Group Vice Presidents share their performance evaluations of IT directors with each IT director's company president. Finally, he would take over succession planning, so that when IT director positions opened up, the company president would receive a short list of candidates from which to choose a successor.

Conclusion

Johnson & Johnson had over one hundred years of experience in decentralized management practices, but the company needed to rapidly adopt processes that enabled it to share data across business units and practice cross-company cooperation. IT management identified several strategies to accelerate the process of implementing Parrish's initiatives:

- Some managers argued for adopting common systems to help implement new data definitions. Others, however, felt that common systems would not meet individual business needs and that clear definitions guiding development of translation programs were key to creating a successful data warehouse.

- Outsourcing was suggested as a means for forcing changes that consensus processes would be slow to embrace. Practices that involved personnel shifts and adoption of standards might be more easily accepted when mandated by external parties.
- Parrish noted that communicating standards and data definitions to senior management would help implementation efforts. As business executives decided they needed new kinds of information, they could enlist support for standards and force agreement on data definitions.

Johnson & Johnson would likely employ all these strategies as it attempted to adapt to dynamic business conditions.

Appendix A

Representative Sample of J&J Operating Companies

Cilag — manufactures and markets products primarily discovered and/or developed by the R.W. Johnson Pharmaceutical Research Institute, includes products in areas such as fertility control, dermatology, and immunoregulatory peptides. Family of operating companies includes Cilag G.m.b.H. in Germany, Cilag-Medicamenta Limitada in Portugal, and Janssen-Cilag Pty. Ltd. in Australia.

Ethicon — develops and markets innovative products for surgeons. It produces thousands of sutures, ligatures and related products. Family of operating companies includes Ethicon, Inc. in the United States, Ethicon S.A. in France, Ethicon Endo-Surgery in Japan and Ethicon Limited in Scotland.

Janssen Pharmaceutica — produces a broad range of pharmaceutical products in areas such as allergy, anesthesiology, gastroenterology, psychiatry, and cardiovascular disease. Family of companies includes Xian-Janssen Pharmaceutical Co. Ltd in China, Janssen Pharmaceutica, Limited in South Africa, Janssen Pharmaceutica S.A.C.I. in Greece and Janssen Farmaceutica, S.A. de C.V. in Mexico.

Johnson & Johnson Consumer Products, Inc. — provides wound care, baby care, oral care and skin care products. These are manufactured and sold in companies throughout the world, including Johnson & Johnson de Venezuela, S.A., Johnson & Johnson Inc. in Canada, Johnson & Johnson Limited in Zambia, and Johnson & Johnson/Gaba B.V. in The Netherlands.

Johnson & Johnson Medical Inc. — provides products for wound management and patient care, such as intravenous catheters, disposable surgical packs, latex surgical and medical gloves, and wound care sponges and dressings. Family of companies includes Johnson & Johnson Medical Thailand, Johnson & Johnson Medical in the Philippines, Johnson & Johnson Medical in Ireland and Johnson & Johnson Medical AG in Switzerland.

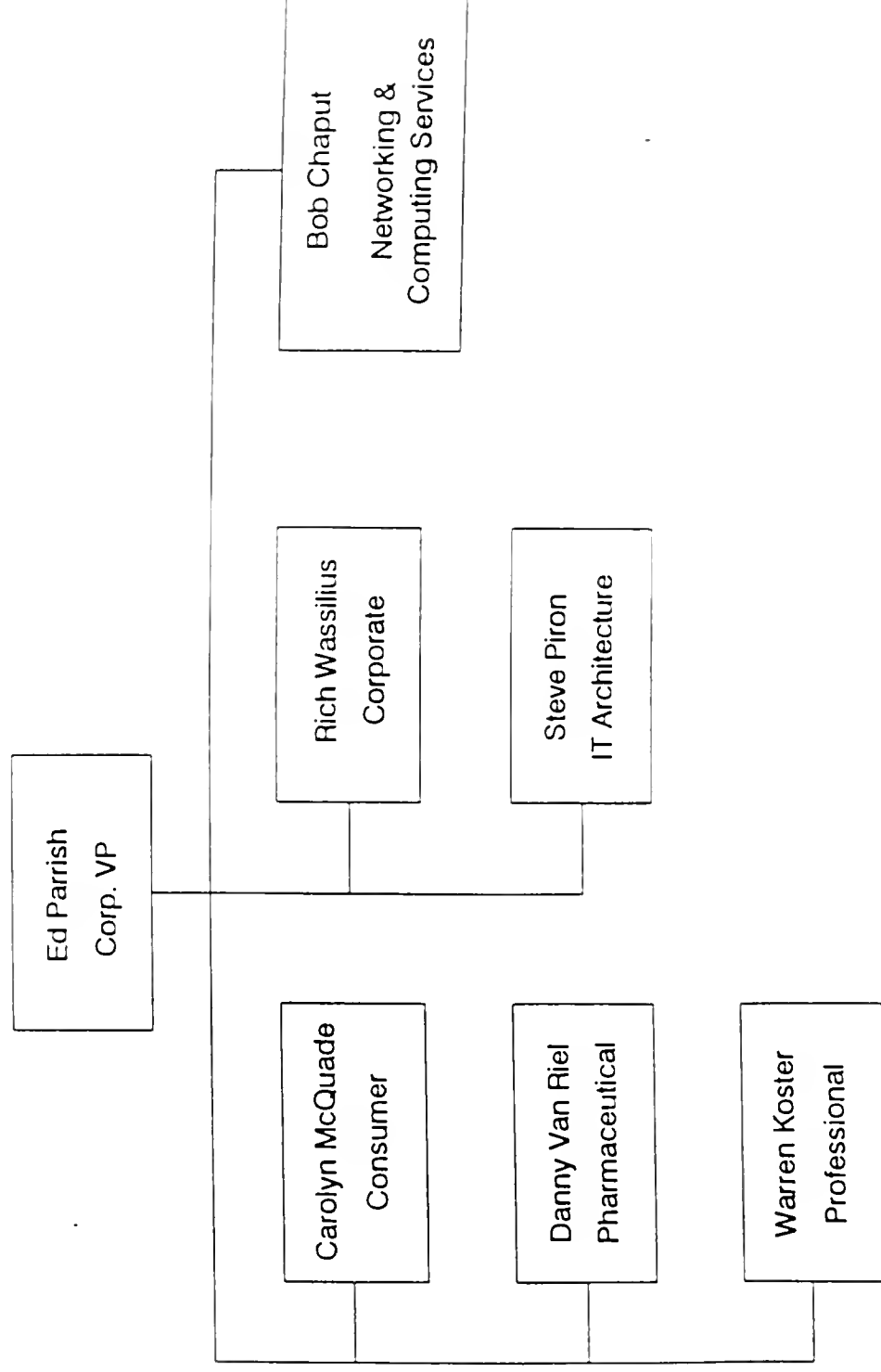
Johnson & Johnson Professional Inc. — develops and markets products under the CODMAN brand for the surgical treatment of central nervous systems disorders and under the J&J Orthopaedics brand for musculoskeletal system repairs. Family of companies includes Johnson & Johnson Professional Products Ltd. in England, Johnson & Johnson Professional Products in Sweden, and Johnson & Johnson Professional Products, G.m.b.H. in Germany.

Ortho Diagnostic Systems Inc — provides diagnostic reagent and instrument systems to hospital laboratories, commercial clinical laboratories and blood donor centers, such as diagnostic systems for coagulation, AIDS, hepatitis and other infectious diseases. Ortho Diagnostics is found in Canada, France, Japan, Spain and the United States.

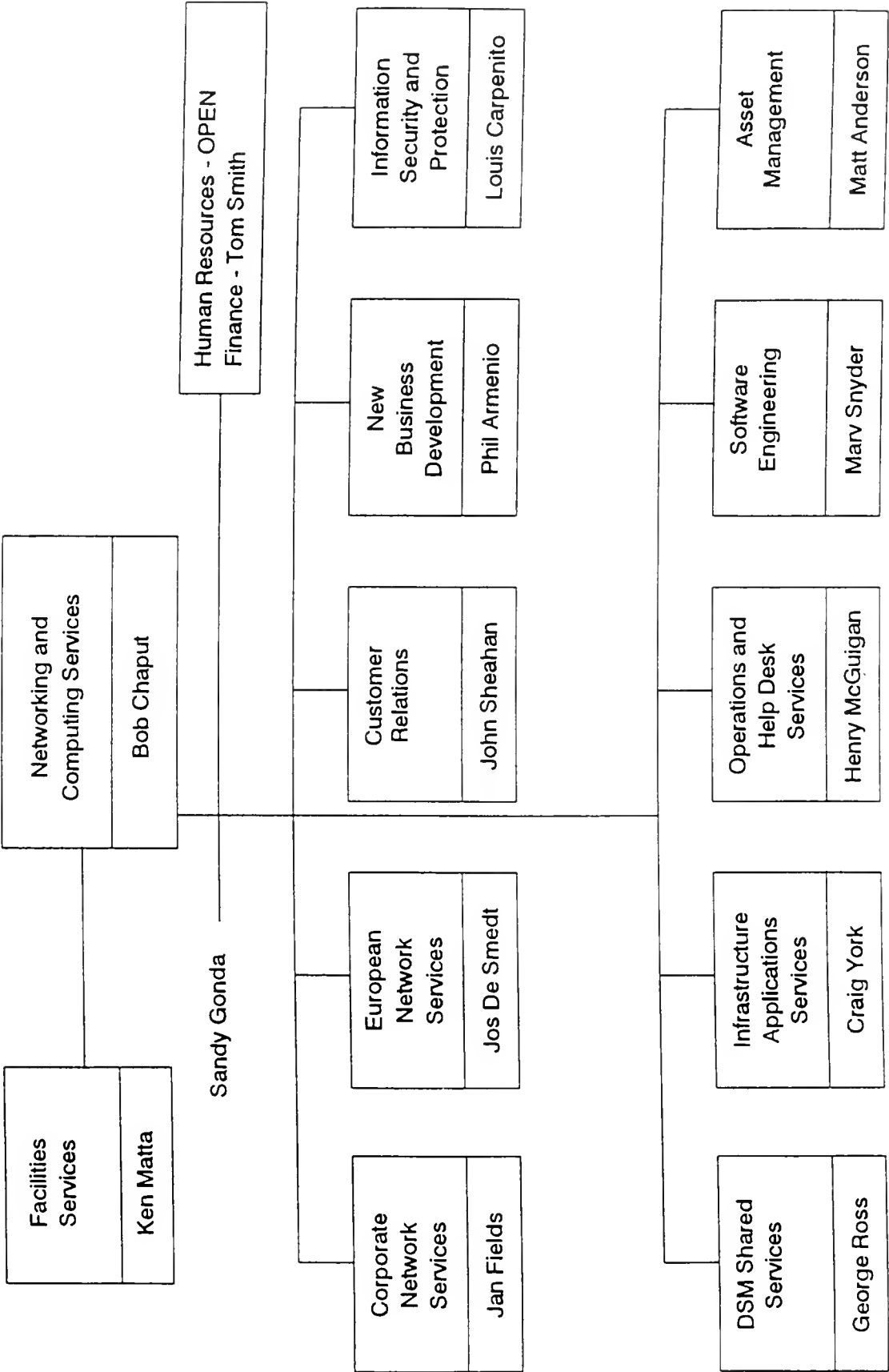
Vistakon — produces and markets the leading disposable contact lens. This operating company is based in the United States.

Appendix B

Corporate Office of Information Technology



Networking and Computing Services



Johnson & Johnson: Building an Infrastructure to Support Global Operations

Teaching Note

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The Johnson & Johnson case poses the arguments for and against establishing centralized IT infrastructure support and IT standards in decentralized, global organizations. It describes changes in J&J's business environment that expose the limitations of the firm's traditional structure and culture, and then examines the role of information technology to help address those limitations. The fundamental problem J&J faces is one that many firms are experiencing — how can the autonomous business units of a large firm present a single face to global customers. The case asks students to consider not only what IT infrastructure would best address current business demands but also how J&J should go about implementing such an infrastructure.

The case can be used in either IS major or general MBA courses. It includes limited technical information on J&J's network design, which will be more readily understood by technically-oriented students. We encourage faculty to help less technical students understand this information, because we anticipate that business managers will increasingly be involved in decisions on IT infrastructure. This means that business managers should be conversant in networking issues, so they can better participate in discussions on IT infrastructure as well as understand the organizational and financial commitment required to make it effective.

Recommended Discussion Questions

1. Describe J&J's organizational structure and culture. How important are this structure and culture to the firm's past and continuing success?
2. Describe the structure of the IT unit that has resulted from J&J's decentralized organization. Why is infrastructure support more decentralized in the U.S. than in Europe?
3. Is the European Network Services model an appropriate model for Bob Chaput's Network Services and Computing unit? What alternatives does Chaput have?
4. What strategies would you suggest to Ed Parrish, the CIO, if he wants to work toward more centralized IT management?
5. What do you think J&J's organizational structure will be five or ten years from now? What are the implications for infrastructure development today?

Suggested Additional Readings

All of the following readings provide useful insights for discussion of the J&J case. Faculty can decide which issues are of greatest interest.

Broadbent, M. and P. Weill, "Infrastructure Mix and Match," *MIS*, October, 1994, pp. 52-55.

Goodhue, D.L., Kirsch, L.J., Quillard, J.A. and Wybo, M.D. "Strategic Data Planning: Lessons from the Field," *MIS Quarterly*, Volume 16, Number 1, March 1992, pp. 11-34.

Keen, P.G.W. and J.M. Cummins *Networks in Action*, Wadsworth Publishing Company, Belmont, California, 1994, chapters 6 and 7.

Kotter, J.P. "Leading Change: Why Transformation Efforts Fail," *Harvard Business Review*, March-April 1995, pp. 59-67.

Lacity, M.C and Hirshheim, R. "The Information Systems Outsourcing Bandwagon," *Sloan Management Review*, Volume 35, Number 1, Fall 1993, pp. 73-86.

Nichols, N.A. "Medicine, Management, and Mergers: An Interview with Merck's P. Roy Vagelos," *Harvard Business Review*, November-December 1994, pp. 104-114.

Von Simson, E.M. "The 'Centrally Decentralized' IS Organization," *Harvard Business Review*, July-August 1990, pp. 158-162.

Class Discussion

The outline for a class discussion on this case would cover the following topics:

- A. Overview of J&J, business strategy, organizational structure and culture
- B. Discussion of business imperatives
- C. Overview of J&J IT Organization
 - 1. Implications of decentralized operating companies
 - 2. Discussion of the benefits and limitations of the European infrastructure model
- D. Discussion of Infrastructure Design for J&J
 - 1. Identification of alternative designs
 - 2. Discussion of strategies to move toward greater centralization
- E. J&J's Business Vision and Implications for Infrastructure Development

J&J Culture and Structure — The recommended class structure would start by discussing J&J's traditional structure and culture. The instructor can ask about the costs and benefits of the highly decentralized structure and probe as to why J&J management feels the need to tinker with what has been a highly successful organization. The class should discuss the potential impacts of the "centralizing" initiatives management has undertaken in recent years (e.g. organization of groups and creation of franchise managers, listed at the bottom of page 2 and top of page 3). The class should observe that J&J's decentralized organizational structures has not only led to a lack of mechanisms and processes for exchanging information, it has discouraged individuals from wanting to exchange

information across operating companies. Thus, J&J employees have neither the technology, nor the will, to support information sharing.

Changes in Business Conditions — As stated throughout the case, J&J is facing new customer demands. In particular, large customers, which include retailers, hospitals and health care providers, want to deal with fewer individuals and companies at J&J. This is why HCS and the Customer Support Center have been formed. The Nichols article discusses changes in the industry in greater depth and might be assigned as additional reading. Business conditions make clear that J&J's traditional organizational structure and processes will come under fire.

IT Unit Organization — The discussion of J&J's structure and business conditions should lead into a discussion of the IT organization. The autonomous nature of the operating companies means that, for the most part, operating companies meet their own computing needs. Moreover, business needs have only recently created a need for widespread coordination of activities across operating companies. Students should be aware that it is business reasons, not technological limitations, that have led to the decentralized organizational structure.

The discussion should explore the implications of this decentralized approach to developing a computing infrastructure. Each operating company has established its own priorities, decided which technologies to adopt and which to avoid, purchased or developed solutions to its business problems, and defined data to meet its unique business needs. We can assume that the level of sophistication of both IT personnel and business users varies considerably across organizations. Similarly, the companies differ in the value they attach to IT and the amount they have invested. There are pockets of expertise within the corporation for many different technologies, but this expertise has typically not been shared across companies. So the corporation has some valuable resources in the form of IT expertise and experience, but it is not leveraging those resources across companies. On the other hand, because the businesses control their IT resources, they are able to ensure that their top priorities are addressed and they can see the results of their IT investments.

The corporate infrastructure has been minimal. Bob Chaput's organization designed voice telecommunications networks for each company and managed the contracts with service providers, but the individual operating companies actually worked with the telephone companies to implement their systems solutions and administer their systems. On the data side NCS also managed a physical network, including bandwidth and physical devices like routers, that enable data transfer between operating companies and the data center, but most of NCS supported the data center and mainframe processing for the corporation's U.S. companies. Transaction processing for sales, billing, payables and other routine processes had been centralized in order to make efficient use of mainframes.

Students should understand that this centralized transaction processing capability means that many operating companies have established electronic linkages with central computers. However, the communications environment is highly constrained, using an SNA architecture in which operating company computers communicate with the host at corporate. (See Keen and Cummins for a discussion of SNA.) The environments within operating companies are characterized by a variety of hardware, operating systems, database management systems and application programs. Thus, in a pure SNA environment, the companies do not have electronic linkages with one another.

Benefits and Limitations of European Structure — Although the firm has a mostly decentralized IT infrastructure, European operating companies have steadily come to rely on central services.

Students should observe the business reason why this developed (one large operating company could offer resources and expertise that were unavailable within small operating companies). Because many of the European businesses sought out the help of the networking experts at Janssen (pronounced yon'son), and other IT support from Corporate, Europe has not had the variety in computing platforms that the U.S. has had.

The significance of the European environment is that it is manageable from a central location. Because European Network Services has implemented a router-based TCP/IP architecture, data can be exchanged among sites as long as data definitions and formats are common. Because essentially all European regional servers are connected to the network, the Network Services staff can provide centralized services to leverage their expertise and provide low-cost infrastructure support. They could establish standard protocols for printing, file transfers, and back-up, and centralize help for desktop applications, groupware, and e-mail. Thus, most European operating companies do not need networking and infrastructure applications expertise on site.

It is worthwhile to explore what European companies are giving up in exchange for cost-effective infrastructure management. Students should readily recognize that management will experience some discomfort with not having local expertise when something goes wrong. Indeed, the long-term success of centralized support infrastructures is at least partly dependent upon the ability of the centralized unit to identify and fix network problems quickly, to provide help desk service to remote sites via telephone and e-mail, and to contract with reliable third parties to service individual companies' on-site needs.

It is also worth noting critical success factors associated with running a centralized unit like European Network Services. Clearly, because they were selling their services to other companies, they had exhibited expertise and an ability to address the networking needs of other companies at a fair price (in other words, the operating companies felt they were receiving good value). It is also essential that European Network staff closely monitor equipment and establish standards for technology that meet business needs and that they are capable of supporting. The instructor will want to establish these and other CSF's for their later discussion of what Bob Chaput might want to do and how he might do it.

In discussing differences between corporate NCS and the European unit, note that corporate IT has responsibility for all J&J networks. The European Network Services team reports into Bob Chaput and has taken on responsibility for the networks, and for support of distributed systems, for operating companies in Europe and Northern Africa. Chaput notes that he would like to institute similar regional centers possibly in Asia and South America, but he would also like to make the European center a model for North American, since a large cost, quality, and service opportunity exists there.

Alternative Designs for the Corporate Infrastructure — It is worthwhile to list what J&J must do to respond to its changing business conditions. Students should recognize that presenting a single face to the customer will demand more than information technology initiatives, but IT will be an important enabler. Non-IT initiatives might include efforts such as developing rewards and incentives for achieving corporate goals, increasing cross-company transfers, and possibly even introducing more umbrella organizations like HCS and the Customer Support Center. IT initiatives fall into 2 categories: (1) generating sharable data through standardized data definitions and (2) providing electronic linkages and support to facilitate exchange of that data. Students should be

aware that it is possible to have one of these without the other, and that the European Network Services model only addresses the latter.

J&J is attempting to address the data standardization challenge through Steve Piron's team. The class may want to debate the idea of defining data definitions across the categories listed on page 8 and then categorizing them as world-wide, country or regional. (The Goodhue *et al* article provides interesting background reading on large-scale data modeling efforts, which is relevant to this discussion.) It should be clear that some data standardization is necessary, but the only success that J&J has had in this area at the time of the case is that which was driven by immediate need — the need for HCS and Customer Service Center companies to share customer data.

Some faculty may want their classes to debate the common systems issue, posed at the end of the case. Common systems, either those produced in-house, or systems like SAP, force some commonality of practice and consequently some standardization of data. Of course, as noted in the case, individual companies may manipulate data from the common systems such that it becomes nonstandard. In addition, some managers resist common systems on the basis that they do not address the unique needs of their business (although this is becoming somewhat less of a concern as newer client-server systems offer increased flexibility). A discussion of common systems should note that in the short-term, they may be expensive to implement and they are inevitably slower to implement than might be expected. The data standardization process (and, to a large extent, workflow standardization) is a necessary precursor to implementation of most common systems. So, gradual acceptance of common systems may be more realistic than reliance on common systems to introduce data standards.

Chaput's expressed desire to use the European center as a model for corporate network support offers one alternative for the infrastructure design at J&J. Students should observe that there are alternative approaches. For example, Chaput plans to extend the regional center concept so that a corporate center is not really needed. (Students should observe that mechanisms for coordinating across the regional centers would be essential. In fact, they may outweigh any benefits to be realized from this model.) Alternatively, given that the U.S. companies are often big and self-sufficient, J&J could work toward some centralization of its IT infrastructure, but remain more decentralized than Europe. For example, headquarters could provide 24x7 (24 hour, 7 days a week) support of networks, but leave local experts at each site. Similarly, help desk personnel could be centralized or distributed. (See Broadbent and Weill for a list of infrastructure services that can be centralized or decentralized.)

Implications of Infrastructure Centralization — The reasons why Chaput wants to pursue the European model are evident from the discussion of the benefits of this arrangement, but students should note that, unlike Europe, centralization will lead to cultural upheaval in U.S. operating companies. Students should consider what might be involved in moving to a more centralized environment:

- much more centralized or consensus decision making
- likely reduction in the IT staffs of operating companies
- service that addresses the common good of the corporation rather than focuses on individual needs (i.e. possible service level reduction)
- greater standardization of hardware, software and operating systems
- higher monthly charges from corporate IT (but lower unit costs)
- possible physical relocation of staff

They should conclude that there will be significant resistance to the idea of centralized infrastructure support.

Strategies for Centralization — At this point, students should be asked what it will take for Chaput to succeed in his efforts to centralize. In particular, they might focus on the initiatives that J&J is undertaking and their likely effectiveness.

- Professional Group shared services: led by the Vice President for Professional Group IT, five companies were insourcing telecommunications management to NCS, and examining the possibility of insourcing distributed systems management. This is a "quick hit" approach to implementing a centralized infrastructure. By providing satisfactory service to this group of five companies, NCS could demonstrate its competence and win acceptance from other operating companies. There is a risk that the companies will not be satisfied and will thus deter other companies from centralized support, but this gradual implementation allows Chaput's organization to take on projects of manageable size. The 'quick hit' approach is a gradual one and students will want to consider whether a strategy of "quick hits" can have the desired impact.
- Implementation of standard technologies: before adopting technology standards, the IT or top business people in an operating company must recognize the value of centralized support; otherwise they can rely on personal favorites. Ed Parrish notes that 80% acceptance is all that is necessary for standards to take effect, but that will require a great deal of senior management support. Note that his role becomes one of communicating standards, and the reasons for those standards, to business management. Students are likely to suggest that top management could mandate the standards. This has been effective in other organizations, but J&J management has tended not to adopt a dictatorial style, thus allowing significant foot-dragging when benefits of new initiatives are not apparent to local managers.
- Outsourcing was suggested as a means of moving the firm to more rapid acceptance of centralization. The risks and rewards of outsourcing are discussed in the Lacity and Hirshheim article. This alternative offers the opportunity for fairly rich debate as to whether enforced organizational change is an appropriate objective for outsourcing.
- Human resource changes for IT personnel: Parrish talks of pursuing training, new pay and reward structures (that would surely reward compliance with standards), and succession planning. Students should observe that all of these approaches are attempts to win compliance through consensus thinking rather than brute enforcement. They might also observe that such approaches are highly consistent with J&J culture.

J&J's Future Business Model — A final question that students should discuss is J&J's long-range business model which the infrastructure must be able to support. In fact, top managers at J&J do not have a single vision of the corporation in the next five to ten years. Some anticipate that it will abandon the operating center concept and consist of just the three Groups or several HCS/Customer Service Center types of businesses. Others feel that the operating company concept will remain strong but that large numbers of umbrella organizations will serve to coordinate their efforts. Still others feel that the operating centers will be supported by sophisticated communications technologies that render franchise management and Groups unnecessary. Students can pose their own view of the future and, in each case, propose what it suggests for how Bob Chaput should shape his

organization.

In wrapping up, the instructor will want to emphasize how business demands are constantly changing and, in the process, requiring organizational changes. Thus, IT infrastructures must also be constantly adapting to new business needs. There is not a single model that will, at a point in time, address all the needs of all firms. (The Von Simson article presents an overview of the hybrid organizational form, which has become the dominant organizational form.)

The J&J case offers an interesting look at how a successful organizational form can become less responsive over time. It also points out how organizational culture acts as an obstacle to organizational change. In J&J's case, the culture is so strong, that efforts by IT management to bring about a more centralized infrastructure are primarily focused on change strategies that are consistent with the existing culture (policies that rely more on developing consensus than on mandating change), even though they will move more slowly to the desired form.

If desired, the case discussion can close with a discussion of the difficulty of changing successful organizations. A significant body of literature has noted that change is much easier to accomplish when a company is facing a crisis than when it is enjoying success. This is clearly a challenge for J&J and most of its operating companies. The instructor may want to close by reviewing the eight reasons why change efforts fail as discussed in Kotter's article (which can be assigned reading or simply reviewed by the faculty member). All eight provide useful advice for J&J as the firm attempts to address changing business conditions and to Parrish and Chaput, in particular, as they work to overcome the resistance to an increasingly centralized IT infrastructure.

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